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⑫ 実用新案公報 (Y2)

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⑬ 考案の名称 血管反転用器具

⑭ 実 願 昭60-201242

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⑦ 実用新案登録請求の範囲

(1) 内側に向いた鉤状の先端部と「く」字状の中間部とを有する3本またはそれ以上の線状部材1と、該線状部材1の基部を先端に固定したスライド部材2と、内部に該スライド部材2をスライド自在に収納し先端に前記線状部材1を収束挿通する開口を有する外筒部材3と、前記線状部材1の中間部と先端部の間に設けられた収束部材4により構成されてなる血管反転用器具。

(2) さらに血管保持部材7を設けてなる実用新案登録請求の範囲第1項記載の血管反転用器具。

考案の詳細な説明

〔産業上の利用分野〕

本考案は、血管吻合などを行なう際に血管の端部を反転するために使用する器具に関する。

〔従来の技術〕

外科手術においては、異常が生じたり損傷を受けた血管の修復のためにしばしば血管の吻合が行われている。血管吻合において最も重要な点は、吻合した際に血管の内膜(内面)同志が全周にわたって密着するように固定することである。もし内膜同志が密着していないと血液が内膜以外の部分に接触することになり、血栓を生成しやすくなる。そこで従来は、血管端部をピンセットなどの

手術用器具を用いて反転してから吻合していた。

〔考案が解決しようとする問題点〕

ピンセットなどを用いた血管の反転には高度の技術が必要であり、手技に習熟した者でなければ

実施が困難であり、時間も長くかかる問題があつた。また、ピンセットなどを用いた場合には操作が行いにくいために血管内膜に傷つけることがあり、手術が失敗することがしばしばあつた。

5 本考案の目的は、血管の反転を極めて容易に行なうことのできる器具を提供することにある。本考案の他の目的は、反転時に血管内膜を傷つける虞のない器具を提供することにある。

〔問題点を解決するための手段〕

10 本考案の器具は、内側に向いた鉤状の先端部と「く」字状の中間部とを有する3本またはそれ以上の線状部材と、該線状部材の基部を先端に固定したスライド部材と、内部に該スライド部材をスライド自在に収納し先端に前記線状部材を収束挿通する開口を有する外筒部材と、前記線状部材の中間部と先端部の間に設けられた収束部材により構成されてなる。

〔作用〕

20 本考案の器具を用いれば、血管の端部を器具の線状部材の鉤状の先端部に引っ掛けてスライド部材を引くという簡単な操作で血管の端部が押し広げられて容易に反転が行われる。

〔実施例〕

25 以下図面を用いて本考案をさらに具体的に説明する。

第1図は、本考案の血管反転用器具の一実施例についての正面図である。器具は3本の線状部材1, 1'及び1'', スライド部材2、外筒部材3並びに収束部材4より構成されている。線状部材

1, 1'及び1''は先端部11, 11'及び11''が内側方向に向かつて鉤状に形成されており、中間部12, 12'及び12''は「く」字状に屈曲している。線状部材はステンレス鋼線のような弾性を有する材料で形成されている。この実施例では線状部材は3本で構成されているが、本考案においては3本以上であれば機能をはたすことができる。4本あるいは5本で構成することもできる。線状部材の基部はスライド部材2の先端部21に固定されており、スライド部材を押したり引いたりするとそれにつれて移動するようになっている。スライド部材2は外筒部材3の中にスライド自在に収納されており、後部22は外筒部材から露出している。外筒部材3の先端には開口31が設けられており線状部材1, 1', 1''が挿通されている。開口31は線状部材の基部が抵抗なく通過できる大きさがあればよいが、線状部材の「く」字部により囲まれる空間より小さいものでなければならない。収束部材4は線状部材を収束し、線状部材の機能が確実にはたされるようするためのものであり、線状部材の「く」字部と先端部の間に設ける。

次に、本考案の器具の機能を第2図で説明する。第2図は、血管の反転が行われる過程を示した正面図であり、器具の後端部は省略してある。まず図aに示すように、血管5をピンセット等の器具6で挟持して端部を線状部材の鉤状の先端部11, 11'及び11''に引っ掛けする。そしてスライド部材2を後方(図の左方)に引くと線状部材も後方に移動し、線状部材「く」字部が外筒部材の開口31で強制的に収束される。図bからわかるように、線状部材は「く」字部が収束されると反対に先端部は拡がるので、血管の端部51が押し抜けられる。さらにスライド部材2を後方に引くと、血管端部は拡がった状態で後方に引かれるが、血管をピンセット等の器具6で移動しないように保持しておくと端部51のみが後方に引かれることになるので反転が起る。反転が起ると図Cに示すように、線状部材の先端は血管から外れ、反転操作は終了する。このように、本考案の器具を用いれば、血管の反転を極めて容易に短時間で

行うことができる。

上述した例では血管の保持をピンセット等の器具を用いて行うようにしたが、本考案の器具に血管保持部材を設けててもよい。第3図は、血管保持部材7を設けた実施例の正面図である。血管保持部材7は血管を2つの挟持部71及び71'で挟んで保持するものであり、挟持部はそれぞれ支持棒72及び72'で支持されて環状部73に連結されている。そして使用前はリブ74及び74'で支持棒72, 72'が押し抜けられており、使用時に血管を挟持部の間に位置させた後に環状部73を回転させて支持棒72, 72'をリブから外し71, 71'で挟む。しかる後に第2図に示すようにして血管を反転させるのである。

反転の必要な血管は小口径のものから大口径のものまで種々あるので、反転に際しては血管の太さに応じて線状部材1, 1', 1''の先端部の拡がりを変える必要があるが、本考案の器具はスライド部材2の位置を変えることによって線状部材の拡がりを調整することができるので、同一の器具を異なる太さの血管に使用することができる。

本考案の器具はステンレス等の金属で製作しておけば繰り返して使用することができるが、主要部をプラスチックで製作して1回限りの使い捨てとすることもできる。

【考案の効果】

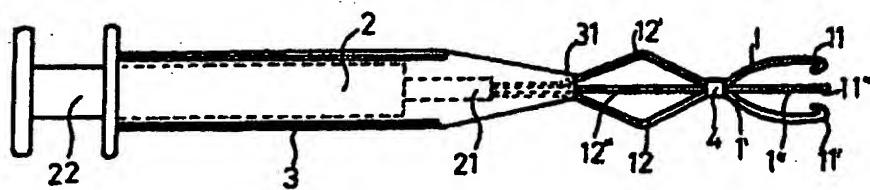
本考案の器具を用いれば内膜を傷つけることなく容易かつ短時間に血管を反転することができる。したがって血管吻合などにおいて極めて有用である。そして前述したように、使用に際して同一の器具を太さの異なる血管に使用することができるという利点を有している。

図面の簡単な説明

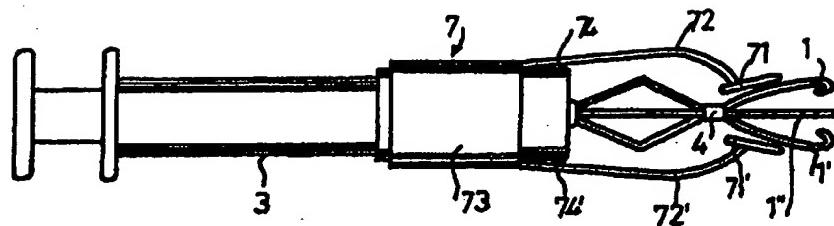
第1図は、本考案の血管反転用器具の実施例についての正面図であり、第2図は本考案の器具を用いて血管を反転する過程を示す正面図である。また第3図は、他の実施例についての正面図である。

1, 1', 1''……線状部材、2……スライド部材、3……外筒部材、4……収束部材、5……血管、6……ピンセット、7……血管保持部材。

第1図

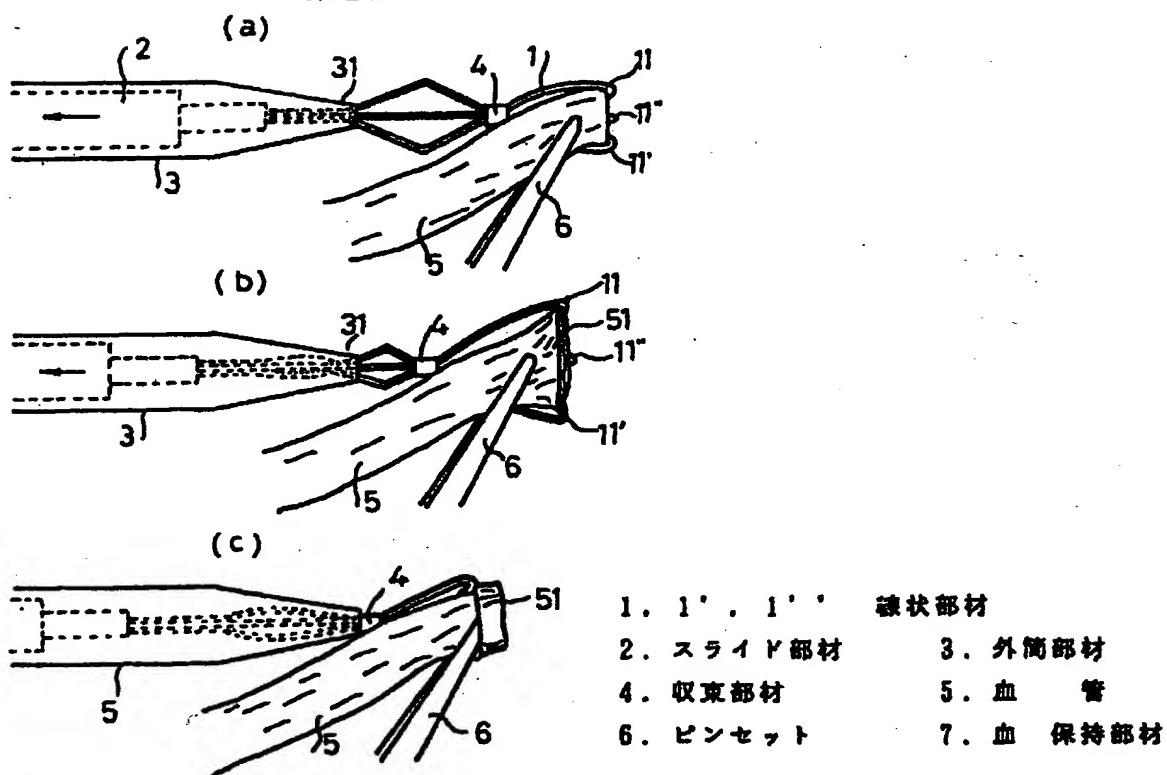


第3図



- 1, 1', 1'' 硬状部材
 2. スライド部材 3. 外筒部材
 4. 収束部材 5. 血管
 6. ピンセット 7. 血管保持部材

第2図



[11] Japanese Utility Model Publication No. 1-43057 B

[24] [44] Publication Date: December 14, 1989

[54] Title of the invention:

A DEVICE FOR EVERTING BLOOD VESSEL

[21] Application No. 60-201242

[22] Application Date: December 25, 1985

[65] Laid-Open No. 62-107810 A

[43] Laid-Open Date: July 9, 1987

[72] Inventor: Fumio YOSHIMOTO

[71] Applicant: JMS co., ltd.

* * * * *

[Claim of Utility Model]

[Claim 1] A device for everting blood vessels comprising:

three or more linear members 1 each having an inwardly oriented hook-shaped tip portion and an elbow-shaped middle portion, a sliding member 2 having base portions of the linear members 1 fixed to the tip portion thereof, an outer casing member 3 for storing the sliding member 2 therein so as to be capable of sliding freely and having an opening at its tip for converging and allowing said linear members 1 to pass through, and a converging member 4 provided on said linear members 1 between the middle portions and the tip portions.

[Claim 2] A device for everting blood vessels as set forth in Claim 1, further comprising a blood vessel holding member 7.

[Detailed Description of the Device]

[Field of the Industrial Application]

The present device relates to a device to be used for everting blood vessel edges, for example, for performing a vascular anastomosis.

[Prior Art]

[Prior Art]

In a surgical operation, a vascular anastomosis has often been performed for repairing a blood vessel that is diseased or damaged. The most important point in a vascular anastomosis is to fix endosporiums (internal surfaces) of the blood vessels so as to keep them in intimate contact circumferentially with each other when performing a vascular anastomosis. If the endosporiums are not brought into intimate contact with each other, blood will be brought into contact with the portions other than the endosporiums, which may result in being more likely to generate thrombus. Therefore, in the conventional art, the edges of the blood vessels are everted by the use of a surgical device such as tweezers before performing vascular anastomosis.

[Problems to be solved by the Invention]

There have been problems that eversion of the blood vessel by the use of tweezers or the like requires an advanced technique and is difficult to perform for the personnel other than those skilled, and disadvantageously, it takes a long period of time. Furthermore, when using the tweezers or the like, since they are difficult to manipulate, the endosporium of the blood vessel may be damaged, and thus a surgical failure may occur frequently.

An object of the present device is to provide a device which may significantly facilitate eversion of the blood vessel. Another object of the present device is to provide a device that is not likely to damage the endosporium of the blood vessel which is being everted.

[Means for solving the Problem]

A device for everting blood vessels according to the present device comprises three or more linear members each

having an inwardly oriented hook-shaped tip portion and an elbow-shaped middle portion, a sliding member having base portions of the linear members fixed to the tip portion thereof, an outer casing member for storing the sliding member therein so as to be capable of sliding freely and having an opening at its tip for converging and allowing the linear members to pass through, and a converging member provided on the linear members between the middle portions and the tip portions.

[Operation]

With a device of the present device, the edge of the blood vessels can be pressed and extended to facilitate eversion by a simple operation of hooking the edge of the blood vessel on the hook-shaped tip portion of the linear member of the device, and pulling the sliding member.

[Embodiments]

Referring now to the drawings, the present device will be described in further detail.

Fig. 1 is a front view of an embodiment of a device for evertting blood vessels according to the present device. The device is constituted by three linear members 1, 1', and 1", a sliding member 2, an external casing member 3, and a converging member 4. The linear members 1, 1', and 1" include tip portions 11, 11', and 11" being inwardly oriented hook-shape, and the middle portions 12, 12', and 12" being bent into an elbow-shape. The linear member is formed of an elastic material such as a stainless steel wire. Though three linear members are used in this embodiment, the function intended in this device can be carried out with any number but not less than three of linear members, and thus it may be constituted by four or five linear members. The base portions of the linear

members are fixed to a tip portion 21 of the sliding member 2, and when the sliding member is pushed or pulled, they move according to the movement. The sliding member 2 is stored in the outer casing member 3 so as to be capable of sliding freely, and the rear portion 22 thereof is exposed from the outer casing member. An opening 31 is formed at the tip of the outer casing member 3, and the linear members 1, 1', 1" are passed therethrough. An opening 31 may be sized so as to allow the base portions of the linear members to pass through without any resistance, but it must be the size smaller than the space surrounded by the elbow-shaped portions of the linear portions. The converging member 4 is a member for converging the linear members for ensuring the function of the linear members, and is attached to the linear members between the elbow-shaped portions and the tip portions.

Subsequently, the function of the device according to the present device will be described referring to Fig. 2. Fig. 2 is a front view showing a process of eversion of a blood vessel, in which a rear end portion of the device is omitted. In the first place, as shown in the figure a, a blood vessel 5 is clipped by a device 6 such as tweezers or the like and its edge is hooked on the hook-shaped tip portions 11, 11', and 11" of the linear members. When the sliding member 2 is pulled toward the rear (leftward in the figure), the linear members also moves toward the rear, and the elbow-shaped portions of the linear members are forced to be converged at an opening 31 of the outer casing member. As is clear in the figure b, since the linear members have such a feature that when the elbow-shaped portions are converged, the tip portions are extended to the contrary, and an edge 51 of the blood vessel is pressed and extended.

When the sliding member 2 is further pulled toward the rear, the edge of the blood vessel is pulled toward the rear in the extended state. At this moment, by holding the blood vessel with the device 6 such as tweezers so as not to move, only the edge 51 is pulled toward the rear, thereby causing eversion. When eversion occurs, the tips of the linear members come apart from the blood vessel as shown in the figure c, which terminates evertting operation. As is described above, with the device of the present device, eversion of the blood vessel can be performed extremely easily in a short period of time.

Though the device such as tweezers is used for holding the blood vessel in the aforementioned example, it is also possible to provide the device of the present device with a blood vessel holding member. Fig. 3 is a front view of an embodiment provided with a blood vessel holding member 7. The blood vessel holding member 7 is a member for clipping and holding the blood vessel with two clipping portions 71, and 71', and the clipping portions are supported by the supporting rods 72, and 72', respectively, and connected to an annular portion 73. Before its use, the supporting rods 72, 72' are pressed and extended by ribs 74, 74', and in its use, after the blood vessel is positioned between the clipping portions, the annular portion 73 is rotated to remove the supporting rods 72, 72' from the ribs, so that the blood vessel is clipped by the clipping members 71, 71'. Subsequently, the blood vessel is everted as shown in Fig. 2.

Since blood vessels which have to be everted may have various size of from small diameters to large diameters, it is necessary to vary the extent of spread of the tip portions of the linear members 1, 1'... upon eversion in

the device according to the present device, spread of the linear members may be adjusted by varying the position of the sliding member 2, and thus the same device may be used for the blood vessels of various thicknesses.

Though the device according to the present device may be used repetitively by employing metal such as stainless or the like as a material, it is also conceivable to form its main portion using plastic as disposable devices for one-use only.

[Effects of the Invention]

With the device according to the present device, the blood vessel may be everted easily in a short period of time without damaging the endosporium. Therefore, it is quite useful in a vascular anastomosis or the like. As is described above, it has an advantage in its use in that the same device can be used for blood vessels of various thicknesses.

[Brief Description of Drawings]

Fig.1 is a front view showing an embodiment of a device for everting blood vessels according to the present device, and Fig. 2 is a front view showing a process of eversion of a blood vessel using the device according to the present device. Further, Fig. 3 is a front view showing another embodiment.

FIG. 1

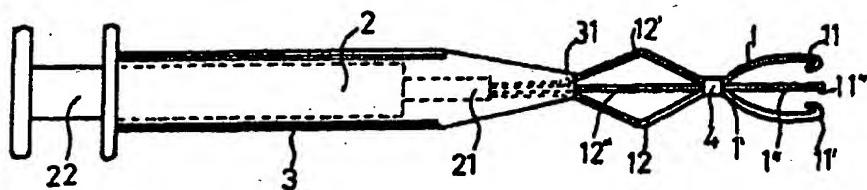
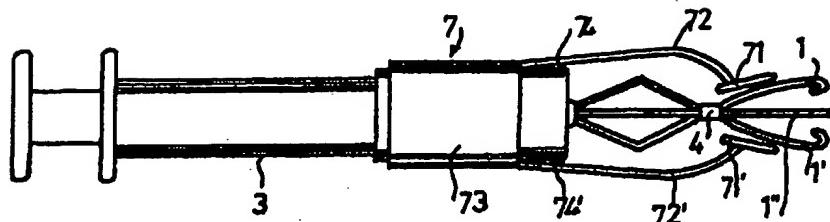
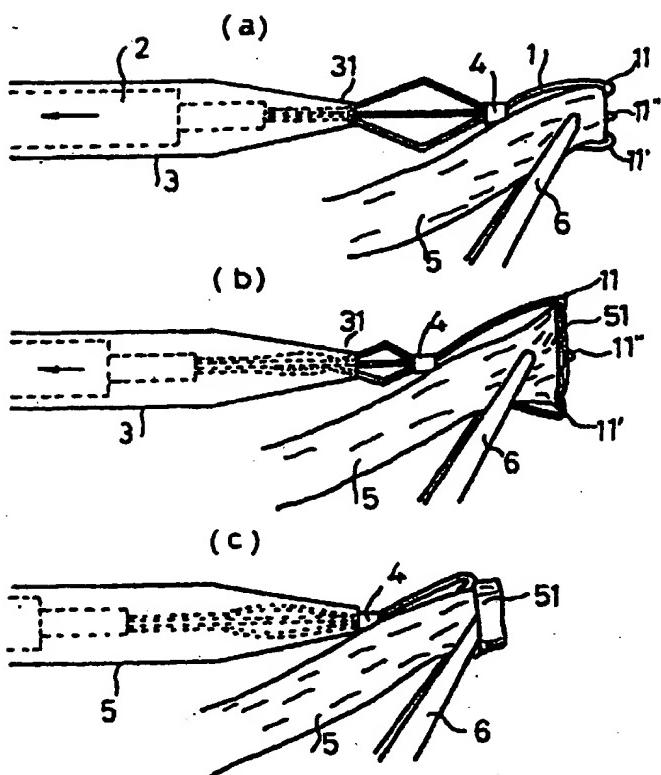


FIG. 3



1, 1', 1" ... linear member 2 ... sliding member
3 ... outer casing member 4 ... converging member
5 ... blood vessel 6 ... tweezers
7 ... blood vessel holding member

FIG. 2



1, 1', 1" ... linear member 2 ... sliding member
3 ... outer casing member 4 ... converging member
5 ... blood vessel 6 ... tweezers
7 ... blood vessel holding member